

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

WIPORule 43bis.1) PCT

To:  
HILL & SCHUMACHER  
87 Falcon Street  
TORONTO, Ontario  
Canada, M4S 2P4

Date of mailing 28 July 2005 (28-07-2005)  
(day/month/year)

Applicant's or agent's file reference  
101060P

FOR FURTHER ACTION  
See paragraph 2 below

International application No.  
**PCT/CA2005/000406**

International filing date (day/month/year)  
16 March 2005 (16-03-2005)

Priority date (day/month/year)  
16 March 2004 (16-03-2004)

International Patent Classification (IPC) or both national classification and IPC  
IPC(7): B01J 29/00, B01J 37/04, B01J 35/02, B01J 20/10, B01J 20/28, B01J 35/10

Applicant  
THE GOVERNING COUNCIL OF THE UNIVERSITY OF TORONTO ET AL

1. This opinion contains indications relating to the following items :

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input checked="" type="checkbox"/> | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input checked="" type="checkbox"/> | Box No. VII  | Certain defects in the international application   |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application  |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/CA  
Canadian Intellectual Property Office  
Place du Portage I, C114 - 1st Floor, Box PCT  
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Gatineau, Quebec K1A 0C9  
Facsimile No.: 001(819)953-2476

Date of completion of this opinion  
27 June 2005 (27-06-2005)

Authorized officer  
Joseph L. Herd  (819) 997-2945

Box No. I      Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form

☐ furnished subsequently to this Authority for the purposes of search.

3 ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statement that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application
- ☒ claim Nos. 1, 14 to 30 (partly-when they refer to claim 1), 31, 32 and 45 to 61 (partly-when they refer to claims 31 or 32.)

because:

- ☐ the said international application, or the said claim Nos. relate to the following subject matter which does not require an international search (*specify*):

- ☒ the description, claims or drawings (*indicate particular elements below*) or said claim Nos. 1, 14 to 30 (partly), 31, 32 and 45 to 61 (partly) are so unclear that no meaningful opinion could be formed (*specify*):

These claims relate to an extremely large number of possible hybrid materials and methods of synthesizing these hybrid materials. In fact the claims contain so many options that a lack of clarity within the meaning of Art. 6 PCT arises to such an extent as to render a meaningful search of these claims impossible. Consequently the search has been carried out for those parts of the application which do appear to be supported clearly, namely metaloxide and organometaloxide material framework which are recited in the examples and the general description.

- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

- ☐ no international search report has been established for said claims Nos.

- ☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

- ☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b).

- ☐ a meaningful opinion could not be formed without the tables related to the sequence listings; the applicant did not, within the prescribed time limit, furnish such tables in electronic form complying with the technical requirements provided for in Annex C-bis of the Administrative Instructions, and such tables were not available to the International Searching Authority in a form and manner acceptable to it.

- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in electronic form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

- ☐ See Supplemental Box for further details.

**Box No. V**      **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims 4, 5, 10, 11, 13, 35, 36, 41, 42 and 44	YES
	Claims 2, 3, 6 to 9, 12, 14 to 30, 33, 34, 37 to 40, 43 and 45 to 61	NO
Inventive step (IS)	Claims 4, 5, 10, 11, 13, 35, 36, 41, 42 and 44	YES
	Claims 2, 3, 6 to 9, 12, 14 to 30, 33, 34, 37 to 40, 43 and 45 to 61	NO
Industrial applicability (IA)	Claims 1 to 61	YES
	Claims none	NO

**2. Citations and explanations :**

US 6,248,686 (D1) discloses mesoporous materials that contain one or more organic groups integral to the structure of the mesoporous materials. The materials can be used in catalytic reactions, separation process and adsorption process. The materials comprise a hybrid composition composed of organic and inorganic materials wherein the organic group is attached to a structure/skeleton by at least 2 metal atoms. The subject matter of claims 2, 3, 6 to 9, 12, 14 to 30, 33, 34, 37 to 40, 43 and 45 to 61 lack novelty according to PCT Article 33(2) and also lack an inventive step according to PCT Article 33(3).

Claims 1 to 61 are industrially applicable according to PCT Article 33(4).

**Box No. VII**      **Certain defects in the international application**

The following defects in the form or contents of the international application have been noted :

Reference to the unpublished US patent application on page 1, line 5 should be removed to satisfy PCT Article 5. Previously filed unpublished applications should not be considered as part of the disclosure, unless the application referred to is made public before the publication date of the international application.

**Box No. VIII**      **Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made :

The description and drawings should be consistent with one another according to Rule 11.13 PCT. Regarding the reference on page 12 to Figure 6, the following inconsistencies are found: (i) the "asterisks" mentioned in line 8 are not found in Figure 6; and, (ii) Figure 6(c) is not detailed in the description.

Reference to the name Pluronic P123 on page 15, line 34 should be identified according to Article 5 PCT.

Claims 1 and 31 are not fully supported by the description according to Article 6 PCT. The subject matter of these claims to the broad concept of "a porous framework material" is not justified by the description and drawings, which disclose only "metaloxide and organometaloxide framework material". More specifically only silica examples are disclosed.

Claim 32 attempts to define the invention by a result to be achieved and therefore lacks clarity under Article 6 PCT.

Claim 58 is contrary to Rule 6.4(b) PCT. The subject matter of claim 58 to a process refers to claims 1 to 30 as process claims. Claims 1 to 30 are product claims.